New Frontiers Pre-solicitation Conference
July 23, 2002, Washington DC

Minutes

SPEAKER: Dr. Colleen Hartman

The meeting was convened at 1:10 pm in the Columbia Room of the Holiday Inn Capitol Hotel, Washington D.C. Dr. Colleen Hartman began with introductory remarks, welcoming participants and describing the basic details of the New Frontiers Program. Dr. Hartman described how the funding mechanism for this program would be a new federal budget line, and thus no congressional approval would be needed for such mid-sized missions (i.e. < $650M), but noted that the final AO release would not occur until the Federal FY03 budget is approved.

Dr. Hartman explained that New Frontiers is basically Discovery +. Total costs to NASA will be capped at $650M, making this a medium-class program for Solar System missions that exclude Mars, Earth and the Sun. The proceedings will be very similar to those of the Discovery Program--with regular selections, launches, frequent access to space (every three years), domestic RTG's, use of (larger) domestic launch vehicles, a TMC and selection process similar to Discovery and Mars Scout.

The goals of the New Frontiers Program will be largely determined by the results of the National Research Council Planetary Science Decadal Study, which was recently released. In general, the goals of the Program will be to look at a variety of science goals, destinations, and targets excluding Mars, Earth and the Sun. The Decadal Study outlined four major science themes for focus in the years 2003-2012. More than 100 investigations were distilled into 12 fundamental questions, which can be addressed in various combinations by 5 strawman missions.

Dr. Hartman discussed the 12 fundamental questions and their associated strawman missions.

There was a question from the audience regarding the Europa Geophysical Explorer (EGE) mission. This mission was explained in some detail, but it was indicated that this mission would be a more expensive flagship mission, and would not be able to fit under the New Frontiers cost cap. The question was that if a cheaper way to do this mission could be devised, would it be seen as acceptable for the New Frontiers Program? Dr. Hartman responded that she was confident that a Europa mission would fall into the New Frontiers Program at some point, but perhaps not until the second or third AO cycle. The New Frontiers scope will be more or less defined by the current top 5 areas defined in the Decadal Study, but Dr. Hartman indicated that she would be very interested to see a Europa orbiter mission in the less than $650M range, as no such feasible mission plan has come to her attention as yet. However, if technology changes alter the structure of our abilities, we will be able to modify the New Frontiers priorities appropriately. Although

this may likely not be possible for the first AO release, Dr. Hartman indicated that she would love to be proven wrong.

There was further discussion and description of the 12 key questions. The point that the scope of the program will *not* be limited to the strawman missions, but *will* be limited to the key science goals.

Dr. Hartman opened to the floor for questions.

Q: Will there be a draft of the AO released this fall, or do you hope to release the AO itself this fall?
A: We will try to release a draft, perhaps with a 1-month lag time prior to the release of the final text of the AO. [The plan was changed following the conference to amend the extended FBO announcement on the New Frontiers Acquisition Home Page with details as they become available and bypass a formal draft AO review cycle.]

Q: Are there any launch date restrictions?
A: We are now looking at 2009 rather than 2008 for launch...but no later than 2009. This is subject to change.

Q: Are we restricted to the 5 missions described in the Decadal Study?
A: No. You are not limited to the specific missions, but you are limited to the key science goals outlined in the Decadal Study. Particulars of a given mission are engineering and situation specific, but the overriding science goals will be the same. You are free to propose in your own manner, which will hopefully be innovative and low risk and wonderful, and will actually afford us the science results and make it through the scrutiny of the TMC process...

Q: There will be no non-US RTG's: paid for or at all?
A: Under no circumstances will any non-US RTG's be allowed for use in this program. No foreign launch vehicles will be allowed. And under any circumstances, all external contributions, foreign or domestic, must not exceed 1/3 of the Phase C/D Cost Cap of $410M.

Q: Can you repeat the last part of the answer?
A: Phase C/D is capped at $410M. Foreign contributions can not exceed 1/3 of this cap, or 1/3 of $410M.

Q: Does the launch vehicle cost come out of the $650M mission cost cap or the $410M Phase C/D cost cap?
A: The launch vehicle is purchased in Phase C/D, and thus comes out of the C/D cost cap of $410M.

Q: Are there policies covering launch vehicles co-developed between US and non-US partners?

A: We will have a speaker coming on later who will discuss specifics on launch vehicle restrictions--Karen Poniatowski.

Q: In your presentation, slide 11, bullet #3, you indicated that "The first AO will solicit mission proposals for two or more of the Decadal Survey's top five medium-class investigations." How far will you take this?
A: The answer remains to be determined. Basically, we must first figure out what the key science objectives for each of the five strawman missions will be, and then figure out the best mix for competition. We can't do this properly until we have gone through and figured out the main science objectives for all five strawman missions, and given the recent release of the Decadal Study we have not yet been able to finalize this. We were aware when we scheduled this meeting that there would be a lot of unanswered and unanswerable questions, but we thought it was worthwhile to give basic background information on how New Frontiers will be run because once the budget is secured, we hope to release the AO very quickly. We intend to fund $15M in 2003, then raise funding levels heavily in 2004. The first mission is absolutely crucial to the continuity of funding in the future. You have touched on the overriding important question, which we can not yet answer, but hope to soon be able to answer.

Q: Two missions will be selected out of the 5-mission set?
A: No. One mission will be selected. The subset is based on the Decadal Study, which lists 5 missions in the medium-class range. We need to take this subset and define specific science objectives, the key science inherent in the 12 questions, but how we do this remains to be determined.

Q: The AO will include more than one of the five objectives?
A: That is the current plan.

Q: Does the 1/3 of C/D cost cap for foreign contributions include or exclude foreign management of the mission?
A: All foreign participation is included in the 1/3 of C/D cost cap limitation.

Q: The mission cost cap is $650M, with a Phase C/D cost cap of $410M. This leaves $240M for phases A, B and E. This seems like a lot to spend in A/B/E.
A: You don't have to propose to the cap. Secondly, you must remember that missions may be very far-reaching and may go 10-15 years out, requiring higher maintenance and data costs.

Q: But we don't do much when we are just cruising towards the targets...
A: Well, we always say that but it never turns out this way. There are lots of costs that are accrued in Phase E, and although cost savings are possible, they have rarely occurred on past missions. These costs account for the possibility of an extended Phase E.

(There was clarification from Dr. Tom Morgan, New Frontiers Program Scientist, that these numbers were simply scaled up from the Discovery Program and are quite reasonable estimates.)

Q: How much will be awarded for Phase A?
A: This will be determined by the TMC evaluation results. We don't like to give out a number, it all depends on what comes in. There are some rough estimates available on the web--i.e., we plan to fund up to 3 missions at $1M a piece for a 6-month Phase A study.

Q: Have you designated a page count or other proposal details?
A: The details such as page numbers will be scalable from Discovery. We are waiting for congressional approval of the budget, and once we have this in place we will be able to determine further the specifics.

Hearing no further questions, Dr. Hartman thanked the participants for their interest and involvement in the meeting. She concluded by remarking that this is a very exciting program, a program that will be, with the Discovery Program, the foundation and cornerstone of the coming decade in space science exploration.

Dr. Hartman then introduced the next speaker, Dr. Guenter Riegler.

SPEAKER: Dr. Guenter Riegler

Dr. Riegler began by describing the Two Mechanisms for Space Flight Mission Selections, via the Strategic-Planning Cycle and via Mission "lines." New Frontiers falls under the Mission "lines" mechanism. Dr. Riegler then showed a condensed flow chart outlining the Proposal Evaluation and Selection Process. Notices of Intent (NOI's) were described as non-binding, not a legal requirement in the process, but indicated that these help NASA in formulating assessment teams, for we want to have an idea of who can and can not be asked to serve on TMC or Science Panels without conflicts of interest. (Details on the TMC reviews will be discussed shortly by Mr. Brad Perry.)

Dr. Riegler described in some detail the Science Panel procedures, then Categorization procedures and Steering Committee procedures.

Dr. Riegler pointed out that although the review and selection process in general (and the steering process in particular) may appear to be overly bureaucratic, the presence of an independent set of eyes overseeing the proceedings is extremely valuable and important. In some cases, he pointed out, there has been disagreement on the Categorization of more than 50% of a given set of proposals, and given that the difference between Category I and Category II can mean being in or out of the running for selection, this is an extremely important phase of the process. Sometimes we change nothing, sometimes we change a number of things; the step acts as an independent analysis of the assessments of proposals made in prior steps.

Dr. Riegler then described in some detail the selection process, indicating that those involved in this process are Colleen Hartman, Associate Administrator Weiler, and himself.

Dr. Riegler described in further detail procedures for Categorization, emphasizing especially that good science is not enough. A Category I proposal must be strong scientifically and technically.

Dr. Riegler described in further detail the Steering and Selection procedures. Only Category I proposals will be eligible for funding. If there are no Category I proposals, selections can be made from Category II; however, in recent history this has not been the case.

Dr. Riegler provided three charts on lessons learned for writing good proposals, prepared from a long list of reasons why proposals did not get funded. Among the problems indicated were a lack of focus in the proposal, failure to address all of the questions/requirements of the AO as written, and failure to provide an independent cost estimate. In response to the second problem listed above, for this program we intend to provide a checklist of requirements for proposers to use. It is absolutely critical that you ensure complete attention to all parts of the requirements laid out in the AO. In response to the third problem listed above, Dr. Riegler pointed out that cost realism is a far larger problem for most proposals than technology readiness. He advised that proposers make sure to check all cost estimates independently with individuals who have experience in building and costing actual missions. This will be done by the evaluation panel, so you should be sure that you have already done this at least once, sometimes two or more times to ensure cost realism.

Dr. Riegler then opened the floor to questions. None were asked, and Dr. Riegler turned over the floor to Dr. Thomas Morgan, the New Frontiers Program Scientist.

SPEAKER: Dr. Thomas Morgan

Dr. Morgan began by describing the approach being used in designing the New Frontiers Program. He elaborated the point that this is a new *program*, not a single AO release. It is anticipated that a new AO will be released for this program every 3 years, meaning hopefully 3 full opportunities in the coming decade to meet the set of goals and objectives laid out in the Decadal Study. Dr. Morgan also re-emphasized the point that the actual structures of the strawman missions as suggested in the Decadal Study must not be followed exactly as described, the focus is on the science goals and objectives, which will not change.

Dr. Morgan described the evaluation approach that will be used for this program, and its similarities to the Discovery and Mars Scout models, with the selection process being science driven. The peer review process of the evaluation was described and its importance emphasized--your peers will be involved in evaluating your proposals.

Evaluations will be based on scientific merit, and what you tell us is not inferred. Therefore, be as specific as possible in outlining in your proposal the extent to which your goals and objectives meet the science goals and objectives laid out in the Decadal Study.

Dr. Morgan touched briefly on the importance of the compliance check, to ensure that your proposal meets all of the requirements set out in the AO.

Dr. Morgan described the New Frontiers Program Funding Chart. The funding profile may change, but this overview will help in getting an idea for what is planned.

Dr. Morgan followed by describing general program objectives and timelines, the survey themes which were taken into account in designing the goals of the program, and began discussing Missions and Key Science Questions. He began by discussing Kuiper Belt/Pluto.

Q: Does NASA consider this mission to be significantly different from last year's PKB mission?
A: It is hard to tell at this point. Although I can't make a pronouncement as yet, my personal expectation is that it would have a little more of the Kuiper Belt flavor, but I'm not sure whether the "NASA PKB" would be acceptable.

Dr. Morgan described the South Pole-Aitken Basin Sample Return (SPA-SR), Jupiter Polar Orbiter with Probes (JPOP), Venus *In Situ* Explorer (VISE), and Comet Surface Sample Return (CSSR) missions and goals.

Q: Can you clarify: when you talk about the 2 of the 5 missions, the 12 questions, goals and objectives, are you likely for example to say: We want a Venus mission and these are the goals and objectives...or will the questions be more general than that? Will the focus be, for example, to Venus, or less specific?
A: To me it appears that if we are reasonably dedicated to the Decadal Study, we will go to Venus, as a destination. The goals laid out in the study include Venus as a destination.

Q: What if you have a mission that better fits the objectives than the 5 strawman missions, then what?
A: I don't have an answer off the top of my head. This is a bridge we will have to cross if/when we come to it.

Q: Some questions seem to require that a sample must be brought back cold. Is that how you would read this?
A: The specifics are in there, and they indicate around 150 degrees Kelvin. [Subsequent research indicated that the 150 degrees Kelvin figure was not an assumption of the Decadal Survey medium-class comet mission.]

Q: What is the scope of the science goals for Missions of Opportunity? Are they identical to the full mission goals?

A: No. Missions of Opportunity are like those in the Discovery line, and will not be limited. Missions of Opportunity are very broadly based in terms of targets, and the purpose is just that: it's an opportunity that could be taken, and is not as limited.

Q: Is there a limit to what kinds of missions can be Missions of Opportunity?
A: No, these are wide open. There are no limits, as in recent solicitations.

Hearing no further questions, Dr. Morgan turned over the floor to Mr. Brad Perry.

SPEAKER: Mr. Brad Perry

Mr. Perry spoke on the Technical, Management, and Cost evaluation plans for the New Frontiers Program. The process for New Frontiers will be similar to that for other programs. This is a very important part of evaluations, for a Category I proposal must not only have excellent science, but must also demonstrate the ability to implement the science goals within cost and on time. Mr. Perry described the three main areas of risks for Space Science Missions: Inherent Risks, Programmatic Risks, and Implementation Risks. Only the latter of these three, Implementation Risks, are evaluated by the TMC Panel. Mr. Perry described the New Frontiers Program from a TMC perspective, indicating that the TMC process will be very similar to the Discovery Program, and describing Selection (Phase One) Proposal Risk Assessment. Mr. Perry also indicated that this is a TMC evaluation, not a TMCO (including "Other Factors" such as how you plan to address the E/PO, technology infusion, and other areas); these will not be a part of the TMC Phase One evaluation.

Mr. Perry went on to describe TMC Principles for New Frontiers, TMC Risk Ratings, the TMC Envelope Concept, TMC Key Technical Definitions, TMC Evaluation Considerations for New Frontiers Mission Investigation Proposals, Some Characteristics Applicable to a Low Risk Rating, and Typical TMC Evaluation Questions to be Answered. The Key Technical Definitions and examples will be included in the Appendix section of the AO, so be sure to pay particular attention to them and apply the definitions of contingency (reserve) and margin consistently and accurately throughout your proposal.

Mr. Perry opened to the floor for questions.

Q: There is an option for RTG use. Are there any special risks that TMC will see triggered if a proposal includes RTG's?
A: The AO certainly includes the option for RTG use, as depending upon which location you may be proposing to go to you will likely need an RTG. For that reason and others, RTG's and power sources are areas of evaluation for TMC. Most, if not all missions for this program, will likely have RTG's involved.

Q: Is use of the RTG technology considered low risk here?

A: RTG use is considered to be within a normal amount of risk, and since this risk will be equal among all proposals who propose to use the given technology, this factor will not act as a discriminator between proposals. We'll work with the project to implement the RTG. It will be a GFE item but must fit within the cost cap. Don't refrain from using this technology due to a self-perceived concern over any added risk this use might cause because the destinations and durations of missions will likely require RTG's.

Q: Will cost details and other details for RTG's be identified and clarified in the AO?
A: Yes. Total costs including GFE will be required to fit within the cost cap.

Q: How much funding will be provided for a Concept Study?
A: The current plan is to provide $1M for Phase A, which is substantially higher than in the past. The current thinking is that Phase A must be funded robustly to ensure that everyone can get there. As the AO is not yet finalized, all of us are sharing the best currently available information. However, please note that some of this information can and likely will change as the AO becomes finalized. We are still some distance off from release, but we will be sure to get it out as soon as the budget is finalized, and final details will be available in the AO.

Hearing no further questions, Mr. Perry concluded by urging proposers to pay due diligence to technical implementation considerations. Apply the guidelines you saw today diligently and consistently, and hopefully you will all come in Low Risk!

Mr. Perry then turned over the floor to Dr. Marc Allen.

SPEAKER: Dr. Marc Allen

Dr. Allen began by noting that his presentation would be brief as International issues will be very similar for New Frontiers as in the Discovery Program. Dr. Allen described the Space Act of 1958 and the general NASA framework for International Cooperation. Dr. Allen described the New Frontiers program's similarity to Discovery, in that the limit to foreign contributions will be 30% of Phase C/D funding and in that Missions of Opportunity would be like those in the Discovery Program, although the cost cap is yet to be determined for such missions.

Dr. Allen described the various types of NASA international agreements, including a discussion of the practical differences between an MOU and an LOA. He also indicated that adequate time should be planned for arranging and getting in place LOA's, rather than the rather ideal 3 months as indicated, perhaps budget more like 6 months to get one in place, even when "rushed."

Dr. Allen described the NPD 1360.2 highlights, and although a new set of guidelines is currently being formulated, he indicated that it will likely change little from the current set. The general principle is that there must be a clear benefit to NASA from foreign participation. There was also a discussion regarding schedule risks arising in these areas,

and the main point was to keep things as simple as possible and plan accordingly to avoid compromising your schedules. Dr. Allen touched on export control issues, pointing out that they are not in place simply as laws, but as guiding principles in maintaining the US and NASA competitive base and posture.

Dr. Allen then opened the floor to questions.

Q: Does an LOA clear out all ITAR cobwebs?
A: No, not all of them, but some. Talk to an export counselor. There are a limited set of exemptions we can exercise, but it does not make everything "go away." New rules, including those regarding foreign nationals in U.S. universities, must still be addressed.

Q: Please distinguish the difference between an LOA and a TAA.
A: A TAA is not a NASA creation, it is granted by the Department of Commerce or Department of State. It is applied for by a party who wants to conduct a transfer, and generally speaking, if an exemption does not apply, it helps to have an agreement in place or in progress to help get done what you need to get done.

Q: An existing agreement between the United States and the Canadian Space Agency is supposed to circumvent ITAR issues...rather to help navigate through the ITAR restrictions for Mars Exploration, but it has not proved very fruitful because industry in the U.S. is reluctant to go by NASA Memorandum...should industries be applying for export licenses as well on their own to make double sure ITAR issues are not violated?
A: Companies involved in agreements pay fines if things go south, not NASA. Participants must consult their own counselors on these issues, I am not familiar with the specifics of the particular case you are referring to. Export control is a complex legal environment, and you must be sure to talk to export lawyers for details on these issues.

Hearing no further questions, Dr. Allen concluded his remarks.

The session engaged in a 15-minute break.

Upon return, Mr. Perry introduced Ms. Susan Minor, who was speaking in place of Ms. Karen Poniatowski.

SPEAKER: Ms. Susan Minor

Ms. Minor spoke regarding Launch Services, including NASA Launch Vehicle Options, Key Space Transportation Policies, and NASA Launch Vehicle Qualification Policies. The portion of the presentation covering Foreign Launch Vehicles was skipped due to the fact that such vehicles are not options for use under the New Frontiers Program. Ms. Minor discussed New Frontiers Launch Considerations and what to expect in the AO.

Ms. Minor indicated that the main ELV focus for New Frontiers is on the Delta IV heavy and Atlas V classes. As they have the same payload interface, it is not required that you specify which of these you will use, so be prepared to use either.

In summary, Ms. Minor indicated that NASA anticipates that only Delta IV and Atlas V will be available options for New Frontiers programs.

Concluding her presentation, Ms. Minor opened the floor to questions.

Q: The cost of the two launch vehicles mentioned above are quite different, and it depends even within the family on which model you want. How can you do an accurate costing without knowing which of the models you will be using?
A: The cost classes will be listed in the AO. Look at the Mars Scout AO for example, it lists the costs for both vehicles as essentially equal.

Q: Regarding the Delta IV--does the cost for 2008 include launch?
A: We probably won't have this class in this AO, it will likely be a Class V. [Yes]

Q: Do the performance curves on the websites you mentioned include performance for C3's with additional upper stages?
A: No.

Q: Are there plans to include this data?
A: The data doesn't exist today, it requires development. So, as with Pluto, since they don't exist, we only provide performance curves through the second stage. We can help you figure out rough estimates for a third stage, but we are limited by what is commercially available. I wish the capability existed, but it takes a lot of money to develop it...

Q: So you don't see that changing in the near future?
A: We don't have any development efforts in planning or progress currently except for Pluto, that's it. Pluto AO has some curves for Delta IV/Atlas V with Star48 numbers, but this is Star48B, and thus has different mass ratings, etc. You should get together with specific situations in mind and come up with a solution.

Q: What about SeaLaunch. Is SeaLaunch an acceptable launch method?
A: This is considered a foreign launch. Although the company is more than 60% owned by US interests, it is still considered a foreign launch vehicle and thus not applicable here.

Hearing no further questions, Ms. Minor turned over the floor to Dr. Earl Wahlquist.

SPEAKER: Dr. Earl Wahlquist

Dr. Wahlquist, of the Department of Energy, gave a presentation describing an Overview of DOE's Plans for Radioisotope Power Systems for Future NASA Space Exploration Missions.

In discussing Radioisotope Power System Fabrication, Dr. Wahlquist indicated that DOE maintains the basic infrastructure for fabrication, but if costs arise outside of the normal costs associated with fabrication, NASA funds must be used to cover these overruns.

In a discussion regarding Plutonium 238 (Pu238), Dr. Wahlquist indicated that DOE will, for NASA support, purchase any needed Pu238 from Russia.

Concluding his presentation, Dr. Wahlquist opened the floor to questions.

Q: When does the United States plan to re-establish domestic Pu238 capability?
A: It will not be available until, at the earliest, 2009/2010. It takes 5+ years to build up the manufacturing capacity needed.

Q: How much will an RTG cost?
A: This information will be included in the AO--unfortunately we cannot give you details just yet on this important piece of information.

Hearing no further questions, Dr. Wahlquist turned over the floor to Dr. Barry Geldzahler.

SPEAKER: Dr. Barry Geldzahler

Dr. Geldzahler gave a presentation on Archiving Data with the Planetary Data System. He described the origins and basics of the PDS, and indicated that in the AO requirements will be laid out showing that a preliminary data plan will be required at PDR, and a finalized plan at CDR. Dr. Geldzahler indicated that proposers are encouraged to lay aside adequate funding for data archiving, and that proposers must account for all tracking costs, archiving costs, and all other associated costs. There must also be a "timely," i.e. +6 months from capture, delivery of data, including data captured during integration and testing to see how a given instrument behaves over time.

Dr. Geldzahler indicated that, for the first time, PDS has this year been elevated to Program level within the enterprise, and is now being taken more seriously than ever. He indicated that it would be prudent for proposers to pay similar mind to this aspect of their work.

Concluding his presentation on the PDS, Dr. Geldzahler opened to the floor for questions.

Q: You indicate the requirement for a "timely" +6 months for data delivery, however PDS has its own review process in place that can take a rather long time. How does this fit in to a program like New Frontiers?

A: You are correct. We are working on collapsing the lag time. The data should get in quickly so we can have our review quickly. The purpose of the review is to ensure that formats are correct, etc., and the sooner we get the test data (i.e., as soon as the integration/test phase is finished) the sooner we can get everything moving, dropping the lag time down.

Hearing no further questions, Dr. Geldzahler turned the floor over to Dr. Phil Sakimoto.

SPEAKER: Dr. Phil Sakimoto

Dr. Sakimoto thanked the participants and welcomed them. He expressed his excitement over the Education and Public Outreach programs put in place by NASA. "This is the fun part--this is not only where you get to, but where we require you to bring your discoveries back to the people, particularly the school teachers and children in our country." Dr. Sakimoto indicated that his presentation on Education and Public Outreach was an introduction to topics to consider in creating and writing a program proposal.

Dr. Sakimoto indicated that the goals for E/PO are to put these unique discoveries in the eyes of the public in a way that helps them to understand what the program was all about, what it means, and why it is important. There is a special focus on the needs for special emphasis in science, math, and technology teaching in the US. The particular concern is that, looking ahead to the future, we want to have a qualified workforce to take over the future parts of current missions and future missions. We are beginning an era when a majority of kids now entering school are "minorities"- not to get into semantics, but simply a special focus must be made on involving communities that have been under-served and under-utilized traditionally in the space science community.

Dr. Sakimoto shared excerpts from the Hart-Rudman Report relating to education. In discussing "Where Are We Now," Dr. Sakimoto made clear that the stated firm commitment to making a substantive contribution to pre-college education and the broad public understanding of science, mathematics, and technology, should in no way be taken as an indication of stepping backwards from working with and training post-docs and graduate students. This is simply a new emphasis on pre-college education in addition to the existing undergraduate, graduate, and post-graduate programs.

In a discussion of what NASA is looking for in the New Frontiers CSR's, Dr. Sakimoto explained that before selection from Phase A, only general ideas and plans should be included. Simply indicate that some considerations have been made on planning an E/PO effort in your program planning. Some of the required information can not be obtained prior to selection and further progress, and we don't expect you to have a fully developed E/PO plan before Phase A. We do want an indication, however, that you are planning and developing an E/PO program and some detail as to your plans. Dr. Sakimoto pointed out that E/PO should account for 1-2% of the total mission budget -- not 1-2% of each mission phase, but 1-2% of the *entire* mission budget. You will likely spend most of your E/PO money after you get your data, etc. Dr. Sakimoto also pointed out that E/PO

has played a role in selections, and thus E/PO requirements should be noted and taken seriously.

Dr. Sakimoto recommended that proposers read the Explanatory Guide for E/PO Evaluation Criteria carefully and in depth, as it was written particularly with proposing scientists in mind.

Concluding his presentation, Dr. Sakimoto opened the floor to questions. Hearing none, he turned the floor over to Dr. Morgan.

WRAPUP QUESTION/ANSWER SESSION

Q: Will viewgraphs be available online?
A: Yes, in 1-2 weeks, plus minutes. All materials will be posted on the extended FBO announcement site.

Q: Do you see the New Frontiers Program as being linked with the nuclear space initiative program? Presumably it is at some level, with the inclusion of RTG's and all, but are there other implications for later in the decade?
A: The immediate linkage is in the RTG usage, but as for the nuclear propulsion component...the $650M cost cap may be problematic to some situations, especially for deep Solar System exploration, but by the end of the next decade we might see technology advances and other developments that may allow for this type of program to include those types of technologies.

Q: Will it be possible to know which of the 2 or 3 strawman missions from the set of 5 will be focused on prior to the actual release of the AO?
A: How we will select down from the 5 strawman missions in the NAS Decadal Study to 2 or 3, and how soon it will be known, is yet to be determined. As soon as we know we will get the AO out. We realize this is a key component of the AO, and as soon as this issue has been sorted out it will go to press. We are being as faithful as possible to the Decadal Study, and it is important to remember that this is a Program, not a single AO, and our goal is, in simple terms, to cover all the topics outlined in the Study.

Q: Will Category III technology development funding be awarded here?
A: The Category III issue is up to the selecting official. Category III funding is for technology development only, *not* for flight. If we identify a specific area of technological weakness in a proposal, and all else looks great, funding may be awarded to develop that specific technology. This has happened in the past, but is not usual - not every Category III proposal gets technology development funding. The key here is that the evaluation panels really liked the Science in a proposal, but one area of technology development was lacking, blocking the science goals. However, in the end, it is entirely up to the selecting official.

Q: Would you be willing to release a draft AO before the public law/budget is passed?

A: The current plan is for FBO announcement with an extended announcement as soon as possible. NASA reserves the right for community review and comment on a draft, but that would cause a significant time lag. Another option is to go straight to release with the AO as was done earlier this year with Mars Scout, in lieu of a community comment period. The most streamlined approach would be to release the AO as soon as possible.

Q: Will there be more than $1M provided for Phase A?
A: For each team selected for Phase A, $1M will be awarded for concept studies. This is better than two times more than previous Phase A levels...

Q: A follow up concerning the AO release: Two or more of the five strawman missions will be highlighted in the AO. Once it is decided which ones will go into the AO, the AO will be released right away. This means that a proposal team has little more than 90 days to prepare a mission proposal?
A: One option for consideration is that, if we are not going to release a draft AO for community comment, we could announce the targets in preparation for AO release. For the AO coming out, the information is not yet available, or we would have done so already.

Q: What is the relationship between the existing Pluto program and the New Frontiers Program?
A: This is an issue that remains to be resolved.

Q: It is a little uncertain when New Frontiers can start due to the budget issue, but is there any consideration to release the next Discovery AO earlier?
A: The Discovery Program is very disconnected from New Frontiers. It is an entirely different program, and has nothing at all to do with New Frontiers (although there are structural similarities in the program constructions). There is some potential for delay in the next Discovery release, but this has no coupling to New Frontiers. The most complicating issue here is lack of funding.

Q: Are PDS costs included in the cost cap, or is this a completely different amount of money outside of the cap?
A: PDS costs are included in the mission cost cap. There will be a library document discussing this. You will negotiate the most cost-effective means of getting the data into the system with the various PDS partners. There are subnodes for particular instruments that become a node during the course of a mission, and at the end of a mission the data is transferred to the rest of the PDS. This can be cost effective, but you must be sure that your data formats are correct and nonproprietary and that the community has access to your data.

Q: Does the foreign contribution limit of 33% of Phase C/D cost exclude foreign contributions in Phase E, as far as cost goes?
A: It is contributions vs. money. Generally, in Phase E, with no exchange of funds for science, there is no issue. We are still looking at how to word this part of the AO. We

may limit total contributions at 33%, but we will address the Phase E questions and will post the answers on the web as soon as they are available.

This limitation started in the Discovery Program. The 1/3 limit is the total limit on foreign contributions. We have never stated which phase this comes into, but the total contribution can not be higher than 33% of the Phase C/D cost cap. Thus, if you use 20% of Phase C/D funds in contributions in Phase C/D, you can still use up to 13% of contributed funds in Phase E. Either way, the total of contributions can not exceed a total of 33% of the cost cap for Phase C/D, wherever the funds are spent.

Q: Are these foreign contribution costs included in the cost cap?
A: The cost cap indicates the cost to NASA. Total mission costs can go up as high as roughly $780M. Foreign contributions fall outside of NASA costs and thus outside of the NASA cost cap.

Total contributions can not be higher than 33% of Phase C/D cost limits for any non-NASA contributions. We want to remain the main partner, this is a NASA program, and thus the sum of all non-NASA contributions, foreign and domestic, are capped at 33% of Phase C/D costs.

Q: Can the launch vehicle be foreign?
A: No.

Q: The cost cap for the mission is $650M, for Phase C/D its $410M. In the case of total Phase B and E costs being less than $240M, can the excess be used in Phase C/D?
A: No. The program would simply come in under the cost cap. You are not obliged to spend to the cap, and you can not exceed the cap for any given Phase and reallocate funds.

Q: Given the talk of Delta IV/Atlas V vehicles and the timeframe, is OSS going to be open to piggy-backing New Frontiers missions with MIDEX or Discovery missions if the option arises?
A: This does not seem out of the bounds of possibility, but it is usually not a good idea to do this.

Q: What is the rationale for the Phase C/D cost cap? In order to allow proposers flexibility as described in a previous question, this was changed in previous releases. Why was it changed back?
A: There is no particular guidance to answer your question at this time. We will re-examine the issue.

Hearing no further questions, the meeting was adjourned at 4:45pm.